

Editor's Note:

As part of ITEA's on-going relationship with NASA's Jet Propulsion Laboratory (JPL), this is the second in a series to encourage the study of science and technology among our nation's and the world's youth. Our members will recall from *The Technology Teacher* (March '98) that the goal of our alliance is "to introduce students of varying grade levels to some of the latest and most advanced technologies being tested for use on space missions of the future." This issue's activities are designed to stress the importance of goal setting and realistic planning for elementary age students.

In this issue, your students can join with Deep Space 1 Chief Mission Engineer Dr. Marc Rayman, NASA, JPL, and ITEA to think about their positive place in the future and to learn to establish real goals and objectives. Simply photocopy the goals pledge sheet, have students think about and write down a goal they might have for the next month, several months, or school year, then commit to their goal by tracing their hands inside Dr. Marc's big hand.

"The Space Place" on the World Wide Web is another place where your students can discover many of the amazing advancements in space technology and have fun in the process. The web address is <http://spaceplace.jpl.nasa.gov>.

The Space Place is also linked to ITEA's web site (<http://www.iteawww.org>), as well as NASA/JPL's Deep Space 1 mission web site (<http://nmp2.jpl.nasa.gov/ds1>).

We hope that you and your students continue to enjoy these space technology-related activities.

This activity was planned and written by Jerry Fecht of Market Evolution and Diane Fisher of JPL. Thanks to Sharon Mayeux, a 5th grade teacher in La Crescenta, California, and to Enoch Kwok, a high school teacher in La Crescenta, California, for their review and input, and to Nancy Leon, Education and Public Outreach Manager for Deep Space 1 and other NASA New Millennium projects. Diane Fisher is also the designer of The Space Place web site.

Planning a Space Mission—or a life!

Learning to set appropriate goals for oneself is a valuable life skill for students. Great accomplishments do not happen by accident. They are planned. Step 1 is figuring out what you want to accomplish. If you set your goals too low, reaching them won't get you much farther than you already are. But setting them too high makes it hard to see the steps needed to reach them and may quickly lead to discouragement.

The coming of the new millennium is a great spur to thinking about the future. Although 1000 years is a bit long to feel real to humans (children *and* adults), thinking and talking about such a temporal milestone is a good lead-in to a discussion and activity on goal setting in the shorter, more human time scale.

The goal of NASA's New Millennium Program is to develop and test the new technologies that will enable us to pursue our visions of exploring space in the next century. The Deep Space 1 mission, to launch in October 1998, will be the first of the New Millennium missions. It is only by having clear, long-term goals that NASA and the individuals actually working in the space program have any idea of what to do next to push the space program into the next century.

Until the past 50 or 60 years, scientific and technological advances were usually associated with individuals—such as Galileo Galilei, Benjamin Franklin, or Thomas Edison. Now, however, things happen so fast that we tend to think it is only giant, organized corporations or governments that drive technology. Although NASA is indeed a government agency, it is still the visions and goals of individuals working within NASA, as well as the American people who pay taxes, that enable NASA to accomplish such feats as Mars Pathfinder, and now, Deep Space 1 and the other New Millennium missions.

mission planning

For example, Dr. Marc Rayman, Deep Space 1's Chief Mission Engineer, has had a large role in planning the mission. The mission plan is based not only on NASA's overall goals for the New Millennium Program, but also on his own aligned goals for developing technologies that will enable us to explore places and spaces where we've never been able to go before.

Invite the students to think about their own goals—short-term or long-term. Like a countdown to launch, **goal setting** is the preparation for great things!

Counting down . . .

- | | |
|-----------|--|
| 3 . . . | Set a goal |
| 2 . . . | Decide how to get there |
| 1 . . . | Make the commitment |
| Blastoff! | Go do it and stay pointed toward the target! |

To help them in **deciding how to get there**, encourage students to break down the tasks of reaching their goal into small, realistic steps. Suggest that they set up guideposts along the way to measure how they are doing. Also, it is good to anticipate possible problems and how they might deal with them.

In the sidebar are some possible discussion questions for helping students think about setting goals.

In the left-hand column of the next page, Dr. Marc has listed his goal for the Deep Space 1 mission and the major steps for reaching it. Dr. Marc's handprint tracing, with his signature, is his pledge to stay committed to his goals. The right-hand column is for the students to explore their own goals. After they have filled in their goal and the steps to reach it, they may **pledge their commitment** to their goal by tracing and signing their own handprint inside (or over) Dr. Marc's.

My Goals for the Next ____ Months:

Goal: _____

Steps:

Pledge: _____

(Your Signature)

Marc D. Rayman,
Chief Mission Engineer
Deep Space 1 Project

(sidebar)

Questions for Discussion

What problem can you think of that science might someday solve?

Example: Space travel takes too long to be practical for humans.

How could you state this problem as a goal?

Example: Find a way to make human space travel faster.
Or, find a way to make human space travel *seem* faster.

What are some of the ways scientists could go about solving this problem (that is, strategies)?

Examples: Find a way to make current propulsion technologies faster.
Find an entirely new kind of spacecraft engine.
Look for a way to make space distances shorter ("space warps").
Find ways to put people into suspended animation for long periods.

What would it be like if this problem were solved?

Examples: Humans could colonize Earth-like planets in other solar systems.
People could take a cruise around the solar system on their vacations.

Might there be any other "side effects" of solving this problem?

Examples: People might stop trying to preserve the Earth's environment if they thought they could just move away.
People could travel for hundreds of years in suspended animation and return to Earth many centuries in the future.

Do you think science fiction (movies or books) might affect the goals of real science and technology work?